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CHAMAECYPARIS

(white-cedars or false-cypresses)

Three of the six species of *Chamaecyparis* grow in North America and three others in eastern Asia in Japan and Taiwan.

The native species have much branched twigs, slightly flattened, spreading fernlike in horizontal plane. The small scalelike leaves are paired and short-pointed. They are evergreen but usually die and turn brown after the second or third year but may persist a few years longer. Leaves on seedlings are longer and awl-shaped.

A tree has male and ovulate strobili at ends of different twigs. The small rounded cones mature in 1 or 2 years but may remain attached a short time. They are composed of 6 to 12 rounded, slightly hard scales. Two to 5 small seeds with 2 short lateral wings are borne at the base of a scale. Cotyledons 2.

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ALASKA-CEDAR (*Chamaecyparis nootkatensis* (D. Don) Spach)

Other common names: Alaska cypress, Sitka cypress, yellow cypress, Alaska yellow-cedar, canoe cedar, Nootka cypress, Nootka Sound cypress, Nootka false-cypress, yellow-cedar, Pacific Coast cypress, Pacific Coast yellow-cedar.

Alaska-cedar grows from Oregon to Prince William Sound in Alaska. In Oregon, it is found usually on the west side of the Cascades; its occurrence is recorded three times in Jackson County and Siskiyou County, Calif.[1] An isolated stand has been reported in northeastern Oregon on the Malheur National Forest (*1*).[2] In Washington, it is frequently found on the west side of the Cascades and is known locally at several places on the east side. Alaska-cedar also occurs on the ridges of the Olympic Mountains and on lowlands at mouths of rivers on the Pacific coast west of the Olympics.

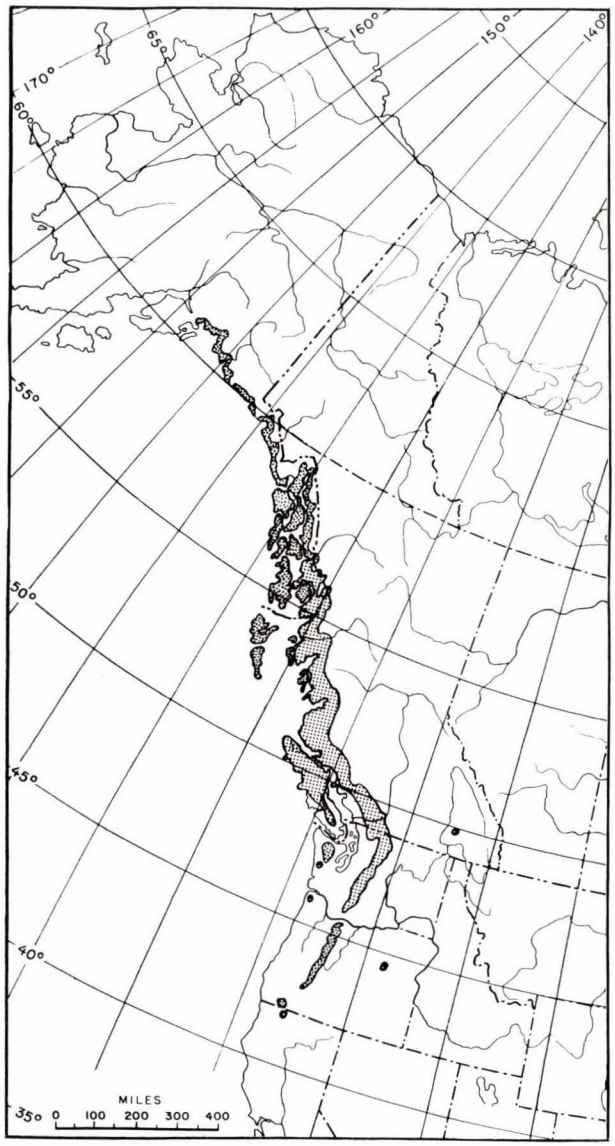
In British Columbia (*4*), Alaska-cedar grows in a narrow coastal belt on the mainland, the coastal islands, and the Queen Charlotte Islands. Also, an isolated stand has been reported at Hird and Evans Lake near Slocan Lake in southern British Columbia about 450 miles inland.

Alaska-cedar is found northward along the coast of Alaska to the Wells Bay in Prince William Sound (longitude 147°30′ W., latitude 61°00′ N.). It is particularly common on Admiralty, Baranof, and Chichagof Islands. In the northern part of southeast Alaska, from Juneau to the Icy Straits on the mainland to the northwestern limits, Alaska-cedar occurs in discontinuous isolated groups. The distribution of these groups suggests that present day stands may be the remnants of more extensive stands which were destroyed in some of the more recent major glacial advances. Studies indicate there were several points of major and minor glaciation in Alaska with intervening warmer periods (*10*). Unglaciated areas have been found along the coast of the Gulf of Alaska and in Prince William Sound (*5*), and it is probable that the isolated Alaska-cedar stands survived destruction by the ice in such areas.

HABITAT CONDITIONS

Climate

Alaska-cedar is confined to a cool, humid climate (table 1). The growing season is relatively short but winter temperatures are not exceptionally severe. The minimum temperatures for various high elevation stations in Washington and Oregon and sea level stations in Alaska do not fall below about −20° F. Snowfall in its range is heavy. The narrow conical crown and flexible dropping leader and flat spraylike branches en-



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The range of Alaska-cedar.

[1] Cowlin, R. W. Personal communication. U.S. Forest Serv. Pacific Northwest Forest and Range Expt. Sta., 10 pp. 1956.

[2] Italic numbers in parentheses refer to Literature Cited, p. 150.

able this species to resist snow damage and breakage; it is the first of its associates to free itself of snow (*8*).

Soils and Topography

Alaska-cedar apparently can grow on extremely poor soils if there is an abundant supply of moisture. It is found on heavy, wet azonal organic subalpine soils, on muskegs with deep moss and peat layers, in half-bog soils, and on lithosols with thin organic layers. In southeast Alaska it sometimes forms stands on rocky soils after Sitka spruce—western hemlock stands and the organic layers have been destroyed by fire. In Alaska, its best development is near the upper limits of merchantable timber on thin organic soils over bedrock where there is abundant groundwater seeping down from higher elevations. It seldom grows on the deeper well-drained soils of the lower slopes and valley bottoms. Yet in Alaska at least, when this species is transplanted as an ornamental, it grows well on deep well-drained soils. It apparently cannot compete with its more aggressive associates, Sitka spruce and western hemlock, except on the poorer or colder and wetter sites.

In the southern part of its range, Alaska-cedar grows on the cooler moist slopes between 2,500 and 6,100 feet elevation. Its altitudinal range in Washington varies from 2,000 to 7,500 feet in the Olympic and Cascade Mountains and to the lowlands west of the Olympics. In southern British Columbia the tree is seldom found below 2,000 feet. South of Frederick Sound in southeast Alaska it does not occur extensively at lower elevations. Northward the elevational range decreases until its lower limit reaches tidewater at Knight Inlet (about 51° N. latitude) (*9*). From this vicinity northward, Alaska-cedar grows at all elevations to the limit of tree growth.

Associated Trees and Shrubs

Alaska-cedar may be a component of the following western forest types: Mountain Hemlock—Subalpine Fir (Type 205); Sitka Spruce—Western Hemlock (Type 225); Western Redcedar—Western Hemlock (Type 227); and Western Redcedar (Type 228). Alaska-cedar grows mainly in mixture with other species, although it sometimes is found in pure stands of limited extent (*6, 9*).

The more common shrubs associated with Alaska-cedar are huckleberry (*Vaccinium* spp.), bunchberry (*Cornus canadensis*), and rusty menziesia (*Menziesia ferruginea*).

LIFE HISTORY

Reproduction and Early Growth

Flowering and seed production.—Flowering may occur from April in the southern parts of its range to late May in the northern parts. It is generally recognized that the cones of Alaska-cedar mature in 2 years but it is possible that in the southern part of its range there are races or individuals whose cones mature in 1 year. Both the first- and second-year cones may be found on a tree. The first-year cones are approximately ⅛-inch in diameter and green in color, while the maturing cones are purplish or purplish-brown in color and ¼- to ½-inch in diameter. The seeds ripen in late September in Alaska and are dispersed during the fall and early winter. Cones may remain on the tree for several years.

No information is available on the distance that wind disseminates Alaska-cedar seed. Because the seed is heavier than that of Port-Orford-cedar, it is probable that it is not disseminated much beyond the 4 to 6 chain limit found for that species

TABLE 1.—*Temperature, precipitation, and growing season at selected points within the range of of Alaska-cedar*

Station	Temperature				Average annual precipitation	Growing season
	January average	July average	Maximum	Minimum		
	°F.	°F.	°F.	°F.	*Inches*	*Days*
Government Camp (Mt. Hood), Clackamas County, Oreg.	30. 3	56. 0	96	−16	84. 81	----------
Paradise Inn (Mt. Rainier), Pierce County, Wash.	26. 1	51. 7	92	−20	99. 35	79
Prince Rupert, British Columbia	35. 0	56. 0	88	−6	95. 16	----------
Petersburg, Alaska	28. 5	55. 6	81	−5	106. 45	129
Sitka, Alaska	32. 4	54. 9	87	−5	87. 13	159
Cordova, Alaska	27. 2	54. 8	87	−19	145. 43	149

(*7*). Based on limited observations in Alaska, it is believed that some seed is produced nearly every year with moderate to good crops every 2 to 4 years.

Vegetative reproduction. — Alaska-cedar is known to reproduce vegetatively but this is not common and details are lacking. Adventitious rooting was noted on this species on Vancouver Island (*11*). New stems may originate where roots become exposed and secondary trunks may develop around the base of damaged trees (*1*, *9*).

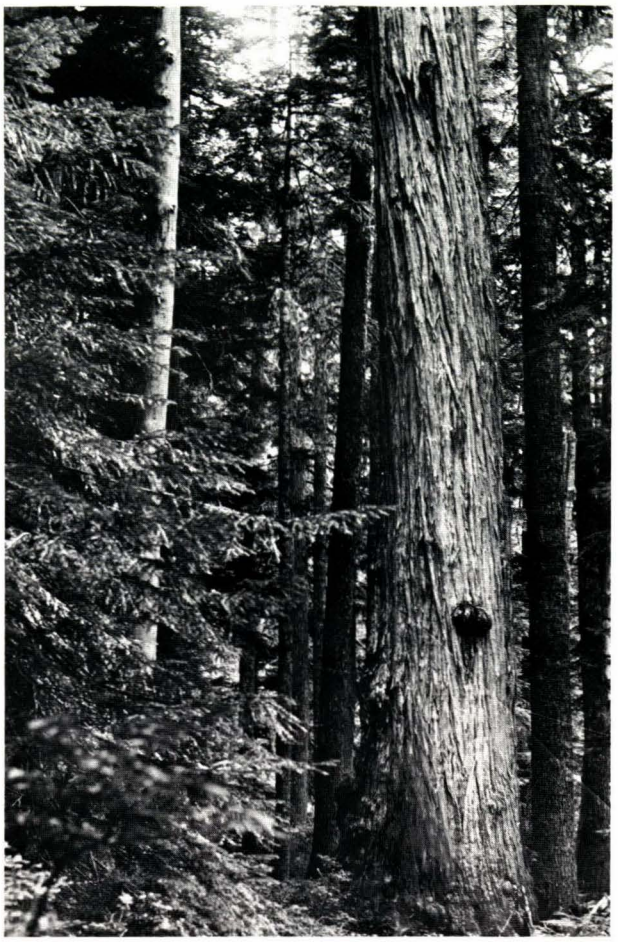
Sapling Stage to Maturity

Growth.—Alaska-cedar is one of the slower-growing and longer-lived western conifers. One hollow Alaska-cedar, 18 feet in circumference, showed 1,040 growth rings in the 1-foot thick outer shell (*8*). Individuals of this species may reach 3,500 years of age (*8*). The largest known living Alaska-cedar is 21 feet in circumference and 175 feet tall in the Olympic National Park, Wash. (*2*). The largest trees and the most extensive commercial stands of Alaska-cedar in British Columbia are in the Nipkish Valley.[3]

Reaction to competition.—Alaska-cedar is considered tolerant (*3*). It is less tolerant than western redcedar and hemlock, but more tolerant than western white pine and noble fir. In Alaska numerous observations of mixed or nearly pure stands of Alaska-cedar failed to reveal seedlings or saplings of this species although western hemlock reproduction was abundant. Observations also showed that the younger stands of Alaska-cedar are essentially even-aged. This tends to confirm that Alaska-cedar is less tolerant than western hemlock. There is considerable evidence that Alaska-cedar is intolerant in the northern part of its range. Its slower growth rate apparently enables it to compete with Sitka spruce, western hemlock, and western redcedar only on sites less favorable for these species.

Principal enemies.—Alaska-cedar, like other "cedar-like" trees, is relatively free from insect damage. There are no known cases of attacks by defoliating insects. Bark beetles of the genus *Phloeosinus* and the bark-boring roundheaded beetles of the genus *Atimia* are often found working under the bark of dead, dying, or weakened trees, and occasionally in healthy trees.

Alaska-cedar seems to be especially susceptible to winter drying in Alaska. In 1956 extensive damage and some mortality were apparently caused by unfavorable moisture conditions that occurred during a bright warm period in the spring while the soil was still frozen. The damage was confined largely to muskeg and scrub stands. The large number of spike-topped Alaska-cedars, found growing in similar situations, may also have been caused by unfavorable moisture conditions on such sites.



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A mature Alaska-cedar in the Pacific Northwest.

Little is known of the fungal diseases of Alaska-cedar. Rhizomorpha of *Armillaria mellea* have been collected between the bark and wood of dead and dying Alaska-cedar in southeast Alaska. These collections were made in the muskeg and scrub types and it is believed the trees may have been weakened by unfavorable moisture conditions. Heart-rotting fungi cause considerable loss and defect but little published information is available.

Catfaces and dead sides are commonly found in trees of this species in Alaska; but the cause has not been determined. The bark is thin and offers little protection against mechanical injury, fire, or sunscald.

RACES AND HYBRIDS

Fifteen horticultural varieties of Alaska-cedar have been recognized. The only known cross is

[3] Schmidt, R. L. Personal communication, British Columbia Forest Service, 1958.

× *Cupressocyparis leylandii* (*Cupressus macrocarpa* × *Chamaecyparis nootkatensis*) originally named *Cupressus leylandii*). This intergeneric hybrid is grown in Great Britain and is hardy in Washington, D.C.

Revised from "Silvical Characteristics of Alaska-cedar," by H. E. Anderson. U.S. Forest Serv. Alaska Forest Research Center, Sta. Paper 11. 1959.

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